

Foresee Your Next Patient

Irritant Contact Dermatitis Caused by Hand Sanitizer Use and Handwashing During the COVID-19 Pandemic

Victoria Pope, DNP, ANP-C • Lisa Ousley, DNP, FNP-C

A 13-year-old girl presented in mild distress with moderate to severe erythema and cracking to the dorsal aspects of both hands. She reported associated pruritus and pain.

History. The girl is a 7th-grade middle-school student being home-schooled under a stay-at-home mandate due to the COVID-19 pandemic. Her parents, both health care workers, have been promoting hand hygiene. The patient reports vigorous handwashing approximately 10 times a day with soap and water, with concurrent application of alcohol-based hand sanitizer, for more than a month.

She has no history of skin disease, no known allergies, and no significant medical history. She has light skin, Fitzpatrick scale type II. She had been applying over-the-counter hydrocortisone cream, 1%, twice a day to the affected area for approximately 4 days with no symptomatic relief or skin improvement. She stated that for the past week, her hands had been painful and “look like an old person’s hands.”

Physical examination. On examination, the patient’s hands were mildly edematous, with innumerable superficial cracks, multiple fissures, and a small amount of bleeding on the dorsa and between several fingers. The erythema stopped at the wrists bilaterally (**Figure 1**).



The patient’s hands at presentation showing mild edema with innumerable superficial cracks, multiple fissures, and a small amount of bleeding on the dorsa and between several fingers. The erythema stopped at the wrists bilaterally.

Diagnosis. The patient received a clinical diagnosis of cumulative irritant contact dermatitis (ICD). No diagnostic testing was required, because the diagnosis is one of exclusion. The diagnosis was based on consideration of the two major types of contact dermatitis, ICD and allergic contact dermatitis (ACD).

Discussion. Contact dermatitis is a common inflammatory skin reaction caused by exogenous factors. ICD, which is often underdiagnosed, is the result of direct damage by chemicals or other physical agents to the stratum corneum. The damage occurs faster than the skin is able to repair itself.¹ Variations of ICD have been described and include acute, acute delayed, irritant reaction, cumulative, traumatic (toxic), xerotic eczema (eczema craquelé), traumatic, pustular and acneiform, nonerythematous, and subjective or sensory.²

ICD, which occurs more frequently than ACD, is a nonimmunologic condition. Patient sensitization is not required. ACD

AFFILIATION:

East Tennessee State University College of Nursing, Johnson City, Tennessee

CITATION:

Pope V, Ousley L. Irritant contact dermatitis caused by hand sanitizer use and handwashing during the COVID-19 pandemic. *Consultant*. 2020;60(7):e8. doi:10.25270/con.2020.04.00015
Received April 10, 2020. Accepted April 21, 2020.

DISCLOSURES:

The authors report no relevant financial relationships.

CORRESPONDENCE:

Victoria Pope, DNP, ANP-C, Assistant Professor, Graduate Programs, East Tennessee State University College of Nursing, 1276 Gilbreath Dr, Johnson City, TN 37614-1700 (popevr@etsu.edu)

2



The patient's hand ICD completely resolved after 7 days of topical corticosteroid treatment, avoiding hand sanitizer use, and handwashing with syndet cleanser followed by a moisturizer.

is a delayed type IV hypersensitivity cutaneous reaction to external allergens in susceptible previously sensitized individuals.¹ ACD is the result of contact with a specific allergen such as rubber, nickel, or perfumes.³ The clinical appearance of ACD may be indistinguishable from acute ICD.⁴

Differential diagnosis. Cumulative ICD is an inflammation of the skin resulting from repeated exposure to an irritant. Between insults, the damaged skin does not have time to repair its barrier function. Cumulative ICD is also linked to exposure to weaker irritants such as soap and water. Symptoms of ICD include pruritus and pain due to cracking of the hyperkeratotic skin.² Signs of ICD include xerosis, erythema and vesicles, lichenification, hyperkeratosis, and chapping. Cumulative ICD lesions are less demarcated compared with those of acute ICD.

Acute ICD, also called irritant reaction, develops when skin is exposed to a potent irritant. The insult is usually related to an accident at home or work or an emergency situation. The irritant reaction reaches its peak quickly and then begins to resolve. Because the time between exposure and reaction is short, the association between irritant and symptoms is usually clear, and the diagnosis can be easily made. Symptoms of acute ICD include burning, stinging, and soreness of the skin.² Signs are erythema,

edema, bullae, and possible necrosis. The lesions are restricted to the area at which the irritant has damaged the tissue. The borders are sharply demarcated, and their asymmetric patterns can hint at an exogenous cause.

Acute delayed ICD is characterized by irritants that illicit a retarded inflammatory response. Acute delayed ICD signs resemble those of acute ICD; however, inflammation is not seen until 8 to 24 hours or more after irritant exposure. Symptoms of acute delayed ICD have many similarities with those of acute ICD; however, the discriminating symptoms of acute delayed ICD are burning and sensitivity to touch and water.

ACD is a T-cell-mediated inflammatory reaction that occurs at the site of exposure with a contact allergen in a sensitized individual.¹ ACD is characterized by the development of redness, papules, and vesicles, followed by scaling and dry skin. Three distinguishing signs of ACD are induration, vesicular eruptions, and intense pruritus. If the allergen is unidentified, the dermatitis may become chronic, with a subtle presentation (no blisters or papules), again making it difficult to distinguish between ACD and ICD.

Management. Fundamental strategies of cumulative ICD management include counseling and topical treatment. For extreme and unresolved cases, oral corticosteroid therapy may be needed.

Counseling includes identifying and avoiding the causative irritant (in this patient's case, an alcohol-based hand sanitizer), educating the patient and family about the cause of cumulative ICD, and discussing strategies to avoid reoccurrence (in this patient's case, handwashing followed by hand sanitizer use was stopped). In this case, the patient and family must be educated on effective treatment of cumulative ICD while maintaining meticulous hand hygiene due to the contagious nature of the COVID-19 virus.

Another priority for patients with ICD is preventing a secondary skin infection, specifically *Staphylococcus aureus* and streptococci.⁵ Prevention of infection is reliant on restoring the stratum corneum's full potential as the skin's protective barrier to infectious agents.⁶ The use of a syndet (a portmanteau word for nonsoap cleanser deriving from *synthetic* and *detergent*) was recommended for handwashing, followed by the use of a moisturizing emollient cream or lotion after she washes her hands and as needed. Cetaphil cleanser and moisturizing lotion were implemented in replacement of hand soap and hand sanitizer.

Topical treatment for ICD should be based on the severity of symptoms. Moderate- to high-potency topical corticosteroids should be prescribed for relief in moderate to severe ICD cases. Selection of the appropriate vehicle (cream, lotion, gel, or ointment) for the topical corticosteroid delivery improves response and adherence. In severe and unresponsive ICD cases, systemic treatment with oral prednisone may be required.

Prognosis and long-term follow-up. The prognosis for cumulative ICD is good. Influencing our patient's prognosis is

the need to follow the COVID-19 handwashing recommendations issued by the Centers for Disease Control and Prevention (CDC).⁷ The CDC recommends washing hands frequently with soap and water and scrubbing for at least 20 seconds. If soap and water are not available, the use of a 60% or higher alcohol-based hand sanitizer is recommended.⁷ The World Health Organization states that “hand hygiene is extremely important to prevent the spread of the COVID-19 virus. [Hand washing] also interrupts transmission of other viruses and bacteria causing common colds, flu and pneumonia, thus reducing the general burden of disease.”⁸

Identifying and avoiding skin irritants and individualizing a person's hand hygiene and skin care routine are vital. Hand hygiene guidelines support that handwashing that is followed by the use of lotions and creams alleviates skin irritation.⁶

Outcome of the case. The patient was prescribed topical betamethasone dipropionate cream, 0.05%, to be applied twice a day for up to 14 days. After 7 days of topical corticosteroid treatment, avoiding hand sanitizer use, and handwashing with

syndet cleanser followed by a moisturizer, her cumulative ICD fully resolved (**Figure 2**). ■

REFERENCES:

1. Tan C-H, Rasool S, Johnston GA. Contact dermatitis: allergic and irritant. *Clin Dermatol*. 2014;32(1):116-124. doi:10.1016/j.clinderma-
tol.2013.05.033
2. Iliev D, Elsner P. Irritant contact dermatitis. In: Gebhardt M, Elsner P, Marks, JG Jr, eds. *Handbook of Contact Dermatitis*. Martin Dunitz; 2000:23-34.
3. Coenraads P-J. Hand eczema. *N Engl J Med*. 2012;367(19):1829-1837. doi:10.1056/NEJMcp1104084
4. Wollina U. Immunopathology of allergic and irritant dermatitis. In: Gebhardt M, Elsner P, Marks, JG Jr, eds. *Handbook of Contact Dermatitis*. Martin Dunitz; 2000:5-9.
5. Paget S. Painful, itchy, swollen hands. *Prescriber*. 2013;24(17):57-58. doi:10.1002/psb.1099
6. Visscher MO, Randall Wickett R. Hand hygiene compliance and irritant dermatitis: a juxtaposition of healthcare issues. *Int J Cosmet Sci*. 2012;34(5):402-415. doi:10.1111/j.1468-2494.2012.00733.x
7. Centers for Disease Control and Prevention. When and how to wash your hands. Reviewed April 2, 2020. Accessed April 23, 2020. <https://www.cdc.gov/handwashing/when-how-handwashing.html>
8. World Health Organization. Interim recommendations on obligatory hand hygiene against transmission of COVID-19. April 1, 2020. Accessed April 23, 2020. <https://www.who.int/who-documents-detail/interim-recommendations-on-obligatory-hand-hygiene-against-transmission-of-covid-19>